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# **The Consistency of Government Deficits with Macroeconomic Adjustment**

## **An Application to Kenya and Ghana**

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and  
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This model analyzes the relationship between the fiscal deficit, the real interest rate, the real growth rate, and the real exchange rate — to indicate what conditions are needed to stabilize a country's debt-to-GDP ratio.

Sustainable medium-term debt strategies are essential to adjustment programs committed to high growth and should be integrated into a consistent macroeconomic framework that encompasses debt, growth, and inflation strategies.

One initial step in this direction is the unification of the accounts of the government and the central bank, to insure that some components of the budget are not shifted from one to the other. A second step is to evaluate the government's fiscal stance in relation to stabilization objectives.

Catsambas and Pigato have developed an analytical model that takes both steps into account. Its purpose is to analyze the relationship between the fiscal deficit, the real interest rate, the real growth rate, and the real exchange rate — and to indicate what conditions would be necessary to stabilize a country's debt-to-GDP ratio in the long run.

Catsambas and Pigato analyze three fundamental concepts of deficit: cash (or observed), primary, and operational<sup>1</sup>. They show that the operational deficit best reflects the government's absorption of real resources and is thus the most appropriate indicator for measuring fiscal policy under stabilization and adjustment.

Applying their model to the empirical data for Kenya and Ghana, Catsambas and Pigato reach these conclusions:

The fiscal effort in Kenya should have been somewhat stronger between 1980 and 1987. For the period 1988-91, the projected fiscal balance is broadly consistent with stabilization, and the same goal can be achieved with a lower inflation or growth rate.

In Ghana, the average fiscal performance between 1980 and 1987 was only slightly weaker than it should have been. Projections for 1988-91 suggest that the government has substantial room for maneuver in its stabilization goals.

This paper is a product of the Trade and Finance Division, Africa Technical Department. Copies are available free from the World Bank, 1818 H Street NW, Washington DC 20433. Please contact Miriam Ruminski, room J8-262, extension 34349.

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## Preface

Adjustment with growth is the dominant objective of reform programs supported by the World Bank in the past few years. Within this context, African countries, particularly those with high indebtedness, aim at achieving structural adjustment while pursuing stabilization goals. In many instances, stabilizing domestic and external debt as a ratio of GDP is a prerequisite for a successful medium-term structural adjustment strategy.

This paper brings into sharp focus the relationship between the government deficit and key macroeconomic parameters. It discusses the consistency of fiscal policy with the stabilization objectives of government, both in a historical context and as a background for evaluating proposed policy actions. By calculating the "operational" deficit, which best reflects the government's claims on resources, and combining the accounts of the Central Bank with the fiscal balance, the paper presents an integrated framework for the assessment of the fiscal stance and its consistency with the inflation, the growth, the interest and the real exchange rates.

The conceptual framework is applied in Ghana and Kenya, and the empirical results are compared with critical developments in the past and with projections for the period through 1991. Apart from the analytical conclusions, the authors point out the need for more accurate information on the stock and flow statistics of Government and the Central Bank for the effective design and successful implementation of an adjustment strategy.

The paper was prepared in the Trade and Finance Division of the Africa Technical Department in the context of ongoing work on learning from, and deepening of the adjustment process.

THE CONSISTENCY OF FISCAL POLICY WITH  
MACROECONOMIC ADJUSTMENT: CONCEPTS, METHODOLOGY  
AND AN EMPIRICAL INVESTIGATION

I. INTRODUCTION

Policy responses by developing countries to the deterioration of domestic and external imbalances in the late 1970s may be classified into two categories: stabilization policies, which aimed at reducing the disequilibria through contractionary demand-management policies; and structural adjustment policies, which aimed at improving both demand and supply conditions, while also changing the institutional parameters of the system.

Since the early 1980s the World Bank has supported policies of structural adjustment, which have gradually moved away from sectoral lending and have encompassed an increasingly larger part of the macroeconomy. An integral part of the adjustment programs has been the redesign of sustainable debt strategies that a country may adopt in the medium term given its contemporaneous commitment to a high growth policy. The concern about growing deficits and debts stems from three, usually interrelated, economic and political consequences: (a) the eventual monetization of deficits, which may lead to hyperinflation situations; (b) the financial crowding out of private investment; and (c) fears of debt repudiation.

It is not the aim of this paper to discuss extensively these issues. However, it is worth noting that the development of a consistent macroeconomic framework is increasingly recognized as a prerequisite for a successful implementation of the structural policies envisaged in the adjustment process.<sup>1/</sup> It is, therefore, important to clarify the inter-relationships among fiscal deficits, domestic and external debt, and macroeconomic variables in the context of a typical adjustment program. This is the underlying theme of this paper.

The most important policy question is what operational framework best describes the absorption of resources by the public sector, especially as regards the tradeoff between servicing of the debt and non-interest government spending. Since the revival of the Ricardian Equivalence Principle <sup>2/</sup> Barro (1974), there has been a growing literature on the subject, which has focused on the proper definition of the budget deficit.<sup>3/</sup> The Ricardian Equivalence represents an extreme view of debt neutrality and its empirical validity has been all but refuted in practice for both developed and developing countries.<sup>4/</sup>

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<sup>1/</sup> See, for example, "Issues in Modeling Macroeconomic Adjustment" (1988), for a comprehensive outline of the features that would be desirable in models of adjustment.

<sup>2/</sup> Under the assumptions that capital markets are perfect, consumers are rational and care about their heirs, and taxes are not distortionary the Ricardian Equivalence theory states that the effects of government expenditure are the same irrespective of the way it is financed.

<sup>3/</sup> Buiter (1985) provides an excellent taxonomy of the various aspects of the problem.

<sup>4/</sup> See, for example, Modigliani et al (1985), Haque (1987) and Haque and Montiel (1987).



There remains, however, the question of which is the most appropriate concept of the budgetary balance for the evaluation of the fiscal stance within the context of adjustment.

There are two basic problems with the conventional measurement of government stocks and flows: First, changes in the real value of public assets due either to inflation or to changes in the exchange rate are not accounted for. Second, the conventional deficit may be artificially inflated by the presence of an inflation premium in the interest payments of the budget. It may be argued that this premium is not regarded as income by the recipients of interest but, rather, as a restoration of the inflation-induced capital losses of the private sector. As a result, private agents are not affected in their spending decisions by the inflation component of interest receipts; in other words, private consumption would not fully respond to nominal interest income. The proponents of this view argue that, consequently, the most appropriate definition of the budget balance is the so-called operational deficit, which is purged from the inflation premium of interest payments and is additionally expressed in real terms. 5/

Another concept of the fiscal balance that deviates from the conventional definition is the primary deficit, which is the non-interest component of the budgetary accounts. As such, this concept gives an indication of the impact of current fiscal stance on aggregate demand, since the interest paid on debt is only the result of past fiscal policies. 6/

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5/ See, for example, Cukierman and Mortensen (1983) for one of the most thorough expositions of this view.

6/ A further explanation of the three concepts of deficit is presented in Report on Adjustment Lending, The World Bank, August 8, 1988.

It is well beyond the scope of the present paper to contribute to this debate <sup>7/</sup>, but it is now well recognized that the operational deficit best reflects the absorption of real resources by government, and thus is the most appropriate measure of fiscal policy within the framework of stabilization and adjustment. This is particularly important for countries whose major concern is the containment of domestic and external debt. For example, the operational deficit identifies all capital losses on external debt, on both a cash and an accrual basis, resulting from a real devaluation of the exchange rate.

A related conceptual and empirical issue is the interface between government and the Central Bank in the financing of the fiscal deficit. Although, in principle, the operations of government are separate from those of the Central Bank, in some countries the accounts of the Central Bank are often used to "hide" the fiscal deficit. This practice obscures the implications of large budget deficits and introduces an element of uncertainty in assessing the true stance of fiscal policy and in drawing policy implications for the future.

The purpose of this paper is to develop a conceptual framework that may be used to analyze the long term sustainability of fiscal deficits in relation to policy constraints posed by the accumulation of public debt. The paper highlights the relationships among the fiscal deficit, the real interest rate, the real growth rate and the real exchange rate and indicates

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<sup>7/</sup> See Catsambas (1988) for a skeptical view on a mechanical application of inflation accounting and related matters.

the conditions that would be necessary for a country to stabilize its debt/GDP ratio in the long run. The analysis involves the calculation of three concepts of deficit discussed earlier: The cash or observed deficit, the primary deficit, and the operational deficit, and provides a quantitative estimate of the extent of the fiscal adjustment, i.e. the required mobilization of domestic resources for achieving the desirable debt/GDP ratio over the course of the adjustment program.

The analysis, with minor modifications, is very similar to the spirit of the Anand and van Wijenbergh (1988) and Coutinho (1988), but less ambitious than the subsequent empirical work on Turkey and Brazil. The present paper is basically a quantification of macroeconomic identities with no attempt to provide econometric estimates of behavioral relationships. As such, it is but a first step towards the development of a consistent analytical framework for the evaluation of fiscal policy in African countries. The analysis is basically methodological and two empirical examples are presented primarily for expository purposes.

The paper is organized as follows. The next part deals with the interface between government and Central Bank accounts and derives the appropriate definition of external debt for analytical purposes. The third part turns to the analytics of deficits and debt within a unified framework between government and the Central Bank. The fourth part presents an empirical investigation of the model for two African countries, Kenya and Ghana, that have had fairly dissimilar experiences in the 1980s. The last part summarizes the findings, highlights the caveats of the analysis and draws conclusions for further research.

## II. THE GOVERNMENT AND THE CENTRAL BANK:

### A UNIFIED APPROACH

This part describes the methodology that unifies the accounts of the Central Bank and Government in such a way as to eliminate the accidental or intentional "shifting" of the budget deficit (or part thereof) to the accounts of the Bank, thus obscuring the true extent of public sector activity. Such a procedure is necessitated by the fact that the Government typically lacks a recorded capital account, whereas the Central Bank always has one in the form of a balance sheet. As a result, the Government usually records only the operations that affect its income statement (i.e. the economic flows related to its budget), but ignores transactions that would affect its capital account, notably capital gains and losses.

This asymmetrical treatment gives rise to potentially paradoxical results, which may be occasionally misleading. Consider, for example, the case of capital gains and losses resulting from a devaluation. For simplicity, let us assume that, at a given point in time, the outstanding debt of government is exactly equal to the net foreign assets of the Central Bank. Furthermore, suppose that the (average) interest rate paid by the Government on its debt is equal to the (average) rate received by the Central Bank on its net foreign assets. If a devaluation takes place, then the following four effects will occur:

- (a) on the income account (deficit) of the Government, there will be an increase in foreign interest payments, and thus the deficit will deteriorate;

- (b) on the (hypothetical) capital account of the Government, there will be an increase in the value of foreign debt, and thus the net worth of Government will decline;
- (c) on the income account of the Central Bank, there will be an increase in foreign interest receipts, and thus the profit position will improve;
- (d) on the capital account (balance sheet) of the Central Bank, there will be an increase in the value of net foreign assets, and the net worth of the Bank will increase.

Furthermore, since we assumed that the government debt equals net foreign assets and the interest rate is identical on both receipts and payments, these transactions conceptually cancel out and the net position of the public sector (defined here as Government plus the Central Bank) remains unchanged.

In practice, however, all depends on the treatment of the various accounts. Usually, the government capital account is ignored and, therefore, even if (higher) interest receipts of the Central Bank are offset by (higher) interest payments in the budget, the net position of the public sector seemingly appears to have improved thanks to the increase in the Central Bank's net worth.

This misleading result obviously calls for a redefinition of the government accounts, to allow for the capital changes that occur in the Central Bank's accounts. This correction takes the form of adding (algebraically) the change in the Central Bank's net worth to the budget deficit. From the profit-and-loss account of the Central Bank we may identify the change in net worth (in terms of flows) as interest receipts plus capital gains or losses on net foreign assets. This is shown in equation (1):

$$(\dot{N}W) = iE(NFA) + \dot{E}(NFA) \quad (1)$$

where NW = net worth of the Central Bank,

$i$  = the average nominal interest rate on foreign holdings,

$E$  = the nominal exchange rate,

NFA = net foreign assets of the Central Bank.

A dot over a variable denotes its time derivative.

We may then redefine the budget deficit as:

$$DEFR = DEF - (\dot{N}W) = DEF - iE(NFA) - \dot{E}(NFA) \quad (2)$$

Where DEFR = revised deficit

DEF = original deficit

and the remaining variables are as defined earlier.

According to equation (2), an increase (reduction) in Central Bank's net worth will reduce (increase) the original deficit. The basic premise is that the (net) financial position of the Monetary Authority 8/ is influenced by the generation of profits or losses in the Central Bank. This is a conceptual formulation and does not necessarily imply that the Central Bank will always transfer its profits to the budget. However, in some countries this is indeed an established procedure.

Consider, now, the two sides of the budget identity:

$$G - T + nB + iEB^* = \dot{C}g + \dot{B} + E\dot{B}^* \quad (3)$$

where  $G$  = non-interest spending

$T$  = tax and not-tax revenue

$n$  = average nominal interest rate on domestic debt

$B$  = domestic debt outstanding

$i$  = average nominal interest rate on external debt

$E$  = nominal exchange rate

$B^*$  = foreign debt outstanding

$Cg$  = credit by Central Bank to Government

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8/ In the remainder of this paper we follow the IFS definition of the Monetary Authority, according to which the accounts of the Central Bank are consolidated with the accounts arising from monetary functions of the Government, such as the issuance of currency or the holding of international reserves and positions vis-a-vis the IMF.

In a very simplified framework, where the Central Bank assets are only net foreign assets and the credit to government, the definition of net worth yields:

$$NW = E(NFA) + C_g - M \quad (4)$$

where M is the monetary base.

$$\text{Therefore, } (\dot{N}W) = \dot{E}(NFA) + E(\dot{NFA}) + \dot{C}_g - \dot{M} \quad (5)$$

Equation (5), which is obtained from the balance sheet of the Central Bank, is the counterpart to equation (1), which was obtained from the profit-and-loss account.

To incorporate the Central Bank's accounts into equation (3), the change in the net worth of the Bank must be subtracted from both the sources of financing and from the deficit.

Hence, we subtract equation (1) from the left-hand side of equation (3) and equation (5) from the right-hand side:

$$\begin{aligned} G - T + nB + 1EB^* - 1E(NFA) - \dot{E}(NFA) = -\dot{E}(NFA) - E(\dot{NFA}) + \dot{C}_g - \\ - \dot{C}_g + \dot{M} + \dot{B} + E\dot{B}^* \end{aligned} \quad (6)$$

Collecting and rearranging terms we finally arrive at:

$$G - T + nB + 1E(B^* - NFA) = \dot{M} + \dot{B} + E(\dot{B}^* - \dot{NFA}) \quad (7)$$



Equation (7) reflects a unified (although not, strictly speaking, consolidated) approach to the measurement of government and Central Bank accounts. It properly reflects both the income statement and the capital accounts of the two public sector entities. For example, following the earlier illustration with  $B^* = NFA$ , the net interest payments of the Monetary Authority would be zero. Similarly, by using the identity:

$$E(\dot{B}^* - NFA) = (E(\dot{B}^* - NFA)) - \dot{E}(B^* - NFA) \quad (8)$$

it can also be seen that the capital gains of the Central Bank would be fully offset by the capital losses of government (the last term in equation (8)). Alternatively, this would imply that a depreciation of the real exchange rate would not affect the net interest payments of the public sector.

The importance of the corrections reflected in equation (7), if properly measured in empirical research, cannot be overstated. By deriving a consistent set of flow and stock accounts for both the Government and the Central Bank, one can effectively eliminate the possibility that (part of) the budget deficit may be shifted to the Central Bank. In other words, equation (7) is the closest concept to the evaluation of the "true" fiscal stance in a given country.

### III. THE ANALYTICS OF BUDGET DEFICITS AND DEBT ACCUMULATION

According to the analysis of the previous section, the budget constraint may now be expressed as:

$$G + nB + iEF - T = \dot{M} + \dot{B} + E\dot{F} \quad (9)$$

where  $F = B^* - NFA$

Equation (9) says that the excess of non-interest expenditures (G) plus interest payments on the domestic (nB) and foreign (iEF) components of the public debt over taxes (T) must be necessarily financed by changes in the stock of high-powered money (M), by issuing new government debt (B), or by using the proceeds of foreign borrowing (F). A dot over a variable indicates its time derivative.

Dividing through equation (9) by the domestic price level, P, we obtain the same relationship in real terms:

$$g + nb + ief - t = \frac{\dot{M}}{P} + \frac{\dot{B}}{P} + e \frac{\dot{F}}{P^*} \quad (9')$$

where a lower-case variable "z" reflects the real value of generic variable "Z", i.e.  $z = \frac{Z}{P}$ . Note that  $e \equiv \frac{EP^*}{P}$  is the real exchange rate, where P is the foreign price level. Then,

$$\frac{\dot{B}}{P} = \dot{b} + b\pi \quad (10)$$

$$\frac{\dot{M}}{\dot{P}} = \frac{\dot{M}}{\dot{M}} \cdot m \quad (11)$$

$$\frac{\dot{F}}{\dot{P}^*} = \dot{f} + f\pi^*, \quad (12)$$

where  $\pi = \frac{\dot{P}}{P}$  and  $\pi^* = \frac{\dot{P}^*}{P^*}$  are, respectively, the rates of domestic and

foreign inflation.

By using Fisher's identity of exchange,  $MV \equiv PQ$ , equation (11) may be rewritten as

$$\frac{\dot{M}}{\dot{P}} = (q + \pi - \theta) m \quad (13)$$

where  $q \equiv \frac{\dot{Q}}{Q}$  is the real rate of growth of GDP, and

$\theta \equiv -\frac{\dot{V}}{V}$  is the rate of change of the income velocity of base money.

Substituting equations (10), (12) and (13) into equation (9') we obtain:

$$g - t + nb + ief = (q + \pi - \theta)m + \dot{b} + b\pi + e(\dot{f} + f\pi^*) \quad (14)$$

which, upon collecting and rearranging terms, yields:

$$g - t + rb + r^*ef = (q + n - \theta)m + \dot{b} + ef \quad (15)$$

where  $r = n - \pi$  and  $r^* = i - \pi^*$ .

Equation (15) describes explicitly the budget constraint in real terms. It says that the excess of government interest and non-interest payments over taxes (the left-hand side of the equation), must be financed

through a change in the real value of domestic debt ( $\dot{b}$ ) or of foreign debt ( $\dot{ef}$ ), or by a change in the real value of the monetary base  $(q + \pi - \theta)m$ . These alternative means of financing are, obviously, not mutually exclusive.

To evaluate the capital gains or losses resulting from changes in the real exchange rate, we may use the following identity:

$$(\dot{e} \cdot f) = \dot{ef} + e\dot{f} = \hat{e}fe + e\dot{f} \quad (16)$$

where  $\hat{e} \equiv \frac{\dot{e}}{e}$  is the change in the real exchange rate.

Substituting for  $\dot{ef}$  from equation (16) into (15) and collecting terms we obtain:

$$g - t + rb + (r^* + \hat{e}) fe = (q + \pi - \theta)m + \dot{b} + (\dot{e} \cdot f) \quad (17)$$

Equation (17) gives a measure of the operational deficit, that is the deficit expressed in real terms and with interest payments evaluated at real rather than nominal interest rates. In the nominal definition of the deficit (equation 9) interest payments are included in the left-hand side of the equation but amortization payments are not. If government securities are issued at variable interest rates, an increase in the inflation rate will be reflected in an increase in nominal interest payments. However, the real

value of the stock of debt decreases at the same time. This is not reflected in equation 9. The operational deficit is the most relevant indicator of fiscal stance when economic agents do not suffer from money illusion. 9/

In order to highlight the constraints imposed on fiscal policy by different financing policies, it is necessary to express the components of equation (17) as ratios of income. Dividing through by real GDP,  $y$ , we obtain:

$$\frac{\dot{g} - \dot{t}}{y} + r\beta + (r^* + \hat{e})\phi = (q + \pi - \theta)\mu + \frac{\dot{b}}{y} + \frac{(e \cdot \dot{f})}{y} \quad (18)$$

where a lower case greek letter represents an income ratio:

$$\beta = \frac{b}{y}, \phi = \frac{ef}{y}, \mu = \frac{m}{y}. \text{ Furthermore,}$$

$$\frac{\dot{b}}{y} = \dot{\beta} + \beta q \text{ and} \quad (19)$$

$$\frac{(e \cdot \dot{f})}{y} = \dot{\phi} + \phi q \quad (20)$$

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9/ Higher inflation rates are associated with higher interest payments and lower values of the stock of real debt. In a world free of money illusion, bondholders perceive the increase in disposable income (due to higher interest payments) as a compensation for the decline in their real wealth (due to the lower value of their bonds). Thus, they do not consume the additional income but restore the value of their initial wealth by buying new government bonds.

Substituting equations (19) and (20) into (18)

we finally arrive at

$$\frac{g-t}{y} + (r-q)\beta + (r^* + \hat{e} - q)\phi = (q + \pi - \theta)\mu + \dot{\beta} + \dot{\phi} \quad (21)$$

A convenient starting hypothesis is to assume that the government is interested in stabilizing the ratio of domestic and external debt to GDP.

Thus, we may set  $\dot{\beta} = \dot{\phi} = 0$ , and derive the value of the deficit that would correspond to a constant debt/GDP ratio.

The resulting equation suggests the relationship between the primary deficit,  $(g-t)/y$ , the ratios of domestic and foreign debt to GDP,  $\beta$  and  $\phi$ , and the revenues from monetization,  $(q + \pi - \theta)\mu$ , seignorage and the inflation tax. The inflation tax  $(\pi\mu)$  measures the revenues obtained as economic agents attempt to keep their money balances constant, in real terms, as inflation increases. Seignorage  $(q-\delta)\mu$  measures the revenues obtained as economic agents increase their real stock of base money as real GDP rises. These variables are linked through the following relationship:

$$\frac{g-t}{y} = (q + \pi - \theta)\mu - [(r-q)\beta + (r^* + \hat{e} - q)\phi] \quad (22)$$

According to equation (22) the ability of the government to extract real resources through monetization (the first term of the right-hand side of the equation), is mitigated by the servicing requirements of the domestic and foreign debt (the last two terms of the right-hand side of the equation). Those, in turn, are influenced by three factors: the real interest rate, the

growth rate, and the real exchange rate changes. It is clear that the higher the domestic and foreign interest rate compared to the economy's growth rate, the less the available room for maneuver in the primary deficit. Similarly, a real exchange rate depreciation, which raises the real cost of servicing the external debt, limits the scope of non-interest government spending. However, as long as the monetization of the economy (in real terms) exceeds the servicing requirements of the domestic and external debt, the government may continue to run a primary deficit.

Equation (22) can be rewritten as:

$$\frac{(g - t) + (r - q) \beta + (r^* + \hat{e} - q) \phi}{y} = (q + \pi - \theta) \mu \quad (22')$$

The financeable deficit, i.e. the sustainable operational deficit (on the left-hand side) is the one consistent with a level of domestic and foreign financing that keep the debt/output ratios constant and with the monetization revenues calculated at target inflation and output growth rates.

Another way of looking at equation (21) is to determine what would be the "warranted" rate of growth in order to stabilize the debt/GDP ratio. Assuming the existence of a "structural" budget deficit, at least over the medium term, the question is whether the stabilization objective can be achieved through "expansionary adjustment", i.e. by an expansionary strategy that would generate the additional resources required for the servicing of the debt. This is the essence of the argument behind the "adjustment with growth" strategy, which has recently become the centerpiece of Structural Adjustment lending.

Setting again  $\dot{\beta} = \dot{\phi} = 0$ , and solving for  $q$  we obtain:

$$q = [(g - t)/y + r\beta + (r^* + \hat{e})\phi - \pi\mu + \theta\mu]/[\mu + \beta + \phi] \quad (23)$$

Equation (23) states that the rate of growth required for stabilizing the debt-output ratio in the economy would be higher, the higher the primary deficit, the higher the interest payments, including the real cost from an exchange rate depreciation and the higher the change in velocity for any given inflation rate. On the other hand, the required growth rate would be lower, the higher the inflation tax ( $\pi\mu$ ) through which the government extracts real resources. These are hardly surprising results.

It is also interesting to observe that equation (21) suggests a duality between growth and inflation in extracting real resources for government. Recalling that:

$$r = n - \pi, \quad r^* = i - \pi^* \text{ and } \hat{e} = \hat{E} + \pi - \pi^*$$

and solving for  $\pi$  we obtain:

$$\pi = [(g-t)/y + (n-q)\beta + (1 + \hat{E} - q)\phi - (q-\theta)\mu]/[\mu + \beta + \phi] \quad (24)$$

where  $\pi$  may be termed the "warranted" inflation rate in stabilizing the debt-output ratio.



The analysis has ignored an explicit discussion of the current account of the balance of payments. Its evolution has been implicitly reflected in the developments of the foreign debt of Government and the net foreign assets of the Monetary Authority. Although the sustainability of the current account is a very important issue, it is not included here, because an empirical application would have required information on the foreign sector activities of government, which is not readily available. However, for purposes of completeness, Appendix I presents a theoretical extension of the model that focuses on the current account of the government sector.

#### IV. AN EMPIRICAL INVESTIGATION : THE CASE OF KENYA AND GHANA

There is currently a major research effort aiming at identifying the interaction among inflation, relative price changes and fiscal adjustment in Africa.<sup>10/</sup> The project, which aspires to develop a general approach to the adjustment process in Africa, incorporates four elements: (a) fiscal and monetary policy; (b) external policies; (c) price controls and subsidies; and (d) wage policy. As part of that project, a paper by Chhibber et al (1989) has already identified, inter alia, the effects of individual prices on different budget items in Zimbabwe.

The conceptual framework developed in this paper could provide a useful background for the kind of analysis presented for Zimbabwe, which is also expected to be applied to three more African countries.<sup>11/</sup> The most interesting question would be to determine the relationship between the actual deficit, and the sustainable financeable deficit, which is determined by seignorage and the inflation tax extracted by the government through monetization. The combination of the two approaches would establish a comprehensive investigation of fiscal adjustment in Africa, from which valuable conclusions could be drawn.

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<sup>10/</sup> The research proposal was prepared by CEC and AF6. For a review of recent experience see O'Connel (1988).

<sup>11/</sup> Those are: Cote d'Ivoire, Malawi and Ghana.

This part shows how the conceptual framework presented earlier could be applied in practice. The investigation focuses on two African countries, Kenya and Ghana, in two periods: 1980-1987, during which fiscal policy is reviewed in a historical perspective, and 1988-1991, for which a forecast simulation is attempted. The next section describes in detail the purpose of the empirical investigation and explains the main methodological steps. Sections 3 and 4 present the empirical results for Kenya and Ghana, respectively, after a brief description of economic developments in the respective country.

1. Purpose of empirical investigation and description of methodology.

The purpose of the empirical application of the model is to apply the methodology developed earlier in two ways: first, from the viewpoint of past economic developments in connection with typical fiscal policy options facing the decision-maker. Second, in the context of a macroeconomic and fiscal framework of projections and targets. In other words, the model may be used both to evaluate the consistency of fiscal policy in the past and to check the consistency between targets and policy variables in the future. The empirical application presented here is basically a quantification of macroeconomic identities. There are no behavioral equations to support the interface between macroeconomic variables and no econometric estimation of behavioral relationships. This has the following implication: whereas the historical

data will necessarily indicate an objective relationship between actual and "desirable" variables, the future simulations are based on "targets" and assumptions, which have been estimated elsewhere. Their compatibility, therefore, (or lack thereof) is not checked by the model. For that reason, a second set of projections for 1988-91 is presented, in which the fiscal target is taken as given, but the two basic macroeconomic variables (namely, the inflation and the growth rates) are determined simultaneously by the model and are checked against the original assumptions. The overall policy objective, which underlies all calculations presented here, is the stabilization of the debt-output ratio.

The basic methodological steps are as follows: For the historical period (1980-87), the model estimates the sustainable operational deficit of the monetary authority, i.e. the maximum financeable deficit for stabilizing the debt-output ratio. As equation (22') suggests, this concept is equivalent to the monetization of the deficit,  $(q-\pi-\theta)\mu$ , and is equal to the sum of seignorage,  $(q-\theta)\mu$ , and the inflation tax,  $\pi\mu$ . This calculation is based on the actual growth and inflation rates for that period. Next, the model estimates the warranted growth and inflation rates, i.e. the rates which would have been required to stabilize the debt/output ratio [equations (23) and (24)]. These calculations are based on the actual operational deficit calculated over the same period. The sustainable operational deficit, and the warranted growth and inflation rates are subsequently compared with their corresponding actual values to assess the implied policy deviations from the desirable strategy.

The simulations for the period 1988-1991 reflect two different approaches. In the first, a consistent fiscal framework is developed based on projected interest payments and on growth and inflation targets provided by World Bank reports, as well as on a few simplifying working assumptions. The sustainable operational deficit is calculated first. Subsequently, the central government cash deficit is estimated. The latter is then compared with the projected cash deficit by the World Bank over the same time period.

The second approach develops a consistent macroeconomic framework. Under this approach, the basic assumptions are the ratio of budget interest payments to GDP and the projected cash deficit, also as a percent of GDP. The model then estimates simultaneously the warranted growth and inflation rates for stabilizing the debt/output ratio, and compares them with the World Bank projections for the same period. As equations (23) and (24) suggest, in this model growth and inflation play identical roles, in so far as they extract real resources for government for the servicing of its debt. But there is no behavioral model linking growth (or employment, or output) with inflation and, consequently, it is not possible to draw conclusions about an explicit policy tradeoff.

The results of these calculations are presented in the next two sections. All calculations are carried out in discrete terms. By convention, a negative fiscal balance represents a deficit and a positive balance a surplus.

## 2. KENYA

### a. Background

Following the coffee boom in the late 1970s, during which foreign reserves increased by 60% and domestic liquidity expanded dramatically, Kenya experienced a deterioration in its domestic and external imbalances. Between 1980 and 1981 the fiscal deficit as a percent of GDP doubled, and so did the inflation rate between 1980 and 1982. The measures adopted by the Government (sales of Government securities and an increase in banks' liquidity ratio) proved insufficient to sterilize the monetary base created by the rising foreign reserves and the enlarged fiscal deficit. The subsequent sharp drop in coffee prices and an overvalued exchange rate were the main causes of the worsening in the current account deficit and of a dramatic fall in foreign reserves.

The period 1980-1987 was characterized by instability and by serious internal and external imbalances but the economy continued to expand at an average rate of 3.7 percent. In 1986, thanks to a second boom in coffee prices, the external position of the country improved considerably and the balance of payments recorded a surplus. All this changed in 1987, as the price of coffee in international markets dropped and Kenya's external terms of trade worsened by 18%. Despite the newly reintroduced import restrictions the

current account deficit jumped from 1% of GDP in 1986 to 6.2% in 1987 and, by the end of the year, foreign exchange reserves could cover less than seven weeks of imports of goods and services.

Kenya's growth prospects are clouded by the fiscal imbalances of the recent past and the creeping growth of the debt/GDP ratio. As Table 1 shows, the ratio of cash deficit to GDP, after a two-year decline between 1981 and 1983 rose again during 1984-1987. There have been exceptional reasons for this unsatisfactory performance: in 1984 Kenya was struck by the most severe drought in 50 years and expansionary fiscal policies had to be adopted in order to assist the affected areas and help the population. Public expenditure kept rising at a faster pace than revenues even in 1986 and 1987, when good weather conditions and favorable prices for export crops supported the economic recovery of the country.

The behavior of the primary deficit, vis-a-vis the cash deficit, shows that interest payments have claimed a very important share of total expenditure in recent years. From 1984 to 1988 total interest payments increased by 120%; during this period domestic and foreign interest payments have risen by 132% and 78%, respectively. This rapid growth in the debt interest overhang was caused by a declining inflation rate, which has resulted in higher real interest rates, and by growing nominal deficits financed by borrowing.

The medium-term fiscal prospects (1988-1991) call for a gradual reduction of the central government fiscal deficit from -4.2 percent of GDP in 1988 to -3.5 percent of GDP in 1991. This reflects a containment of

expenditure to about 29.5 percent of GDP, and a marginal rise in revenue from 25.2 percent in 1988 to 25.9 percent of GDP in 1991. However, interest payments are projected to remain at over 5 percent of GDP throughout the period. On the whole, the basic question is whether the macroeconomic and fiscal projections are compatible with a stabilization of the debt/GDP ratio over the medium-term.

b. Empirical results

Table 1 and Graph 1 present the three fundamental concepts of the fiscal deficit in Kenya for the Central Government and the Monetary Authority between 1980 and 1987. The cash and operational deficits of the respective agencies are very similar, implying that a consolidation of the accounts between the Central Government and the Central Bank adds little extra information. In the case of Kenya this is expected to be the case, since Central Bank profits are transferred to the budget. The primary deficit is by definition identical, since it excludes interest payments and receipts on foreign liabilities and assets. The most interesting result is that in several years during the 1980s the operational deficit was lower than the primary deficit. In some cases, e.g., 1980 and 1981, this was due to substantially negative real interest rates; in others, e.g. 1984 and 1985, it was due to a considerable appreciation of the real exchange rate, which effectively turned budget interest costs negative in real terms.



TABLE 1. KENYA: BASIC FISCAL INDICATORS

(Fiscal Years)

	1980	1981	1982	1983	1984	1985	1986	1987	1986-1987 Average
(in percent of GDP)									
<u>Central Government</u>									
Cash Deficit	-5.0	-9.5	-6.5	-3.5	-3.9	-5.1	-5.4	-7.6	-5.8
Operational Deficit	0.6	-5.5	-3.2	2.2	1.9	4.0	-0.3	-6.3	-0.9
Primary Deficit	-3.1	-7.1	-2.9	0.3	0.2	-0.9	-0.5	-2.9	-2.1
<u>Monetary Authority 1/</u>									
Cash Deficit	-4.7	-9.4	-6.6	-3.7	-3.8	-5.1	-5.4	-7.6	-5.8
Operational Deficit	-0.3	-5.7	-3.0	2.4	1.8	3.2	-0.6	-6.1	-1.0
Primary Deficit	-3.1	-7.1	-2.9	0.3	0.2	-0.9	-0.5	-2.9	-2.1
(in percent)									
<u>Memorandum Items</u>									
GDP Growth Rate	5.7	4.6	3.0	1.5	1.5	3.1	5.0	5.4	3.7
Average Nominal Domestic Interest Rate	3.4	4.7	11.9	14.9	14.4	14.0	16.1	14.2	11.7
Domestic Inflation Rate	10.6	12.7	17.7	18.0	11.6	9.9	8.1	6.4	11.9
Change in Real Effective Exchange Rate 2/	-3.0	-1.9	-1.5	1.3	0.0	0.8	-12.6	-9.3	-2.5
Debt/GDP 3/	35.4	39.0	42.8	44.2	44.4	46.0	48.1	48.9	43.6

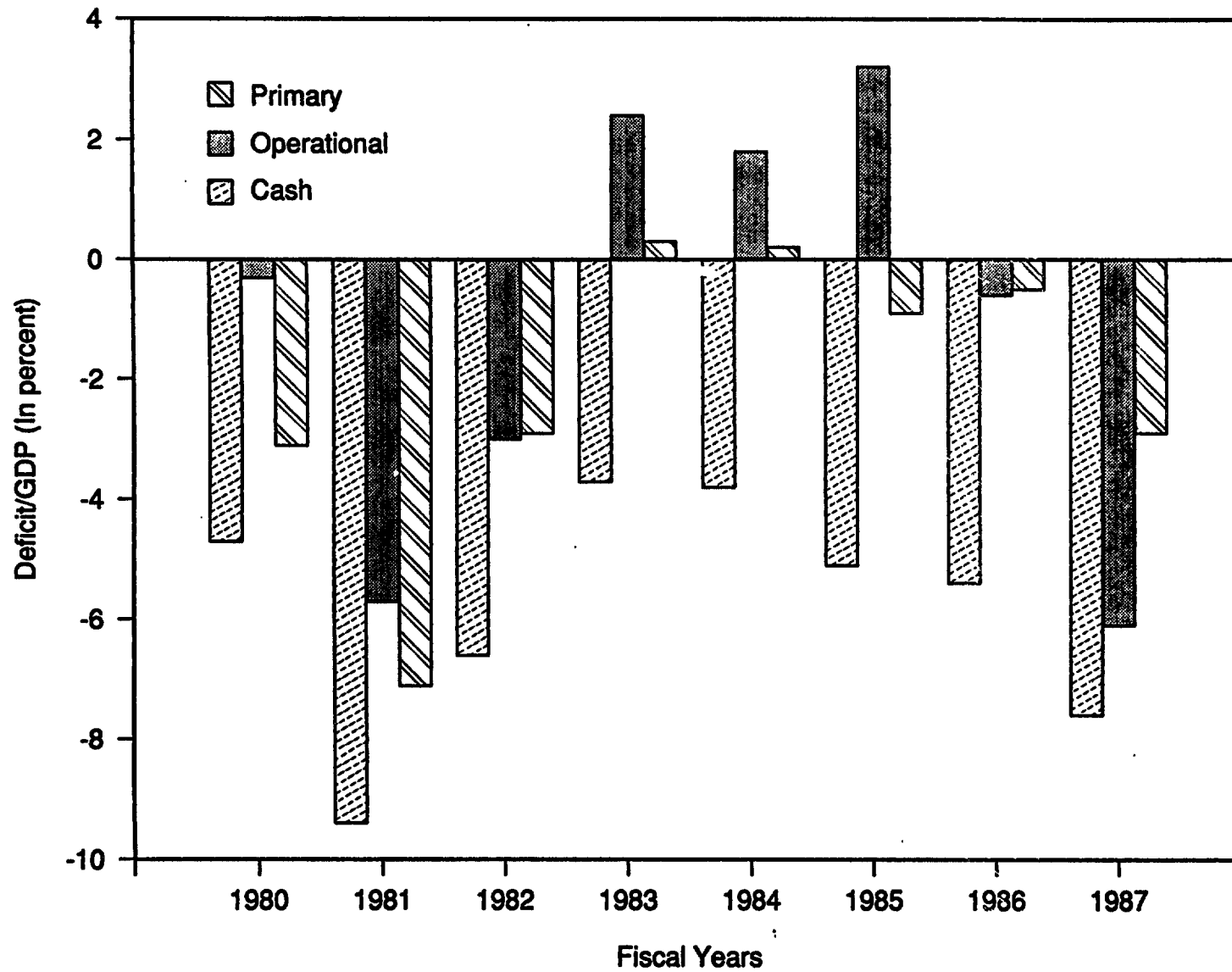
1/ Consolidated accounts of Central Government and Central Bank in respect of holding of international reserves and positions vis-a-vis the IMF.

2/ A negative sign signifies depreciation. A positive sign signifies appreciation.

3/ Net domestic and external debt of the Monetary Authority.

# KENYA: DEFICIT CONCEPTS

1980 - 1987



GRAPH 1

Table 2 shows the derivation of the sustainable operational deficit for 1980-87. On average, the actual operational deficit was -1.0 percent of GDP, whereas the estimated sustainable deficit was only -0.2 percent. As column 5 indicates, stabilization of the debt/GDP ratio would have required a much stronger fiscal adjustment during the first years of the decade than during the latter period. At the same time, the data reveal that in 1983, 1984 and 1985 the government actually had a substantial room for maneuver equivalent to 3.3, 1.0 and 3.6 percent of GDP in the respective years. On average, between 1980 -1987 the required deficit reduction amounted to under 1 percent of GDP.

Table 2 also shows calculations of the "warranted" growth and inflation rates, for the years 1980-1987. On average, the actual growth rate was virtually identical to the required level that would have stabilized the debt/GDP ratio in the Kenyan economy, given its actual fiscal performance. On the contrary, the government could have achieved the stabilization goal with less inflationary finance; the data show that the debt/GDP objective could have been achieved with a reduction of the average inflation rate by 2.6 percentage points. Although the data in table 2 also show the annual developments in the growth and inflation rates, a year-by-year point comparison would probably be misleading, due to the fluctuations in the variables, which in turn are due to the arbitrary definition of the time periods and the data collection process. For that reason, averages provide a better clue towards answering the basic question.

TABLE 2. KENYA: FISCAL POLICY CONCEPTS AND MACROECONOMIC VARIABLES

Fiscal Years	(in percent of GNP)					(in percent)					
	Infla- tion Tax 1/ (1)	Sei- gnorage 1/ (2)	Sustainable Operational Deficit 1/ (3)=-[(1)+(2)]	Actual Operational Deficit 1/ (4)	Required, Deficit Reduction 2/ (5)=(3)-(4)	Warranted Growth Rate (6)	Actual Growth Rate (7)	Implied Growth Differential 3/ (8)=(6)-(7)	Warranted Inflation Rate (9)	Actual Inflation Rate (10)	Implied Inflation Differential 4/ (11)=(9)-(10)
1980	0.8	0.2	-1.6	-0.3	-0.7	-0.1	5.7	-5.8	5.3	10.6	-5.3
1981	1.1	-1.9	0.8	-5.7	6.8	14.9	4.6	10.3	20.8	12.7	8.1
1982	1.4	-2.3	0.9	-3.0	4.1	4.8	3.0	1.8	11.8	17.7	-5.9
1983	1.3	-0.9	-0.5	2.4	-3.3	-7.0	1.5	-8.5	-0.1	18.8	-18.1
1984	0.9	-1.9	1.0	1.8	-1.0	0.5	1.5	-1.0	5.6	11.6	-6.0
1985	0.7	-0.6	-0.1	3.2	-3.6	-1.9	3.1	-5.0	2.9	9.9	-7.0
1986	0.5	-0.1	-0.4	-0.6	0.1	9.1	5.0	4.1	14.3	8.1	6.2
1987	0.4	1.5	-1.9	-6.1	4.9	10.1	5.4	4.7	13.4	6.4	6.9
1980-1987 Average	0.9	-0.6	-0.2	-1.0	0.9	3.8	3.7	0.1	9.3	11.9	-2.6

1/ Monetary authority definition. See footnote 1, Table 1.

2/ A negative number indicates permissible deficit increase.

3/ A positive number indicates required growth increase. A negative number indicates permissible growth decline.

4/ A positive number indicates required inflation increase. A negative number indicates permissible inflation decline.

Table 3 and Graph 2 show the results of simulations for the period 1988-1991 with a view to obtaining a fiscal policy framework consistent with the objective of debt/GDP stabilization. The simulations are based on World Bank projections for the ratio of budget interest payments to GDP and for the inflation and growth rates. <sup>12/</sup> The model assumes no change in the income velocity of reserve money and no change in the real effective exchange rate over the period. The results indicate that the sustainable government cash deficit is slightly lower than the projected deficit, implying a somewhat greater fiscal effort to achieve the stabilization goal. The required average deficit reduction over the period is 0.9 percent of GDP.

Table 4 looks at the same issue by asking a different question: suppose that the government wishes to adhere to the projected cash deficit, and further suppose that the interest payments assumption turns out correct; what would be the growth and inflation rates required to achieve a constant debt/GDP ratio? The fundamental difference between this and the earlier calculation is that here the warranted growth and inflation rates (as well as the implied monetary base, the inflation tax and seignorage) are all calculated simultaneously. In this respect, the results of Table 4 are internally consistent. Note, however, that there is still a lack of a behavioral framework that would provide an unequivocal answer to the

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<sup>12/</sup> Kenya: Public Expenditure Review, Main Report and Annex Volume, Report 7508-KE, November 21, 1988.

TABLE 3. KENYA: A CONSISTENT FISCAL POLICY FRAMEWORK

## Assumptions

	Interest Payments (% of GDP)	Inflation Rate (%)	Growth Rate (%)	Change in Velocity (%)	Real Effective Exchange Rate Depreciation (%)
1988	5.2	8.0	5.0	0.0	0.0
1989	5.5	7.0	5.0	0.0	0.0
1990	5.3	6.0	5.0	0.0	0.0
1991	5.3	5.0	5.0	0.0	0.0

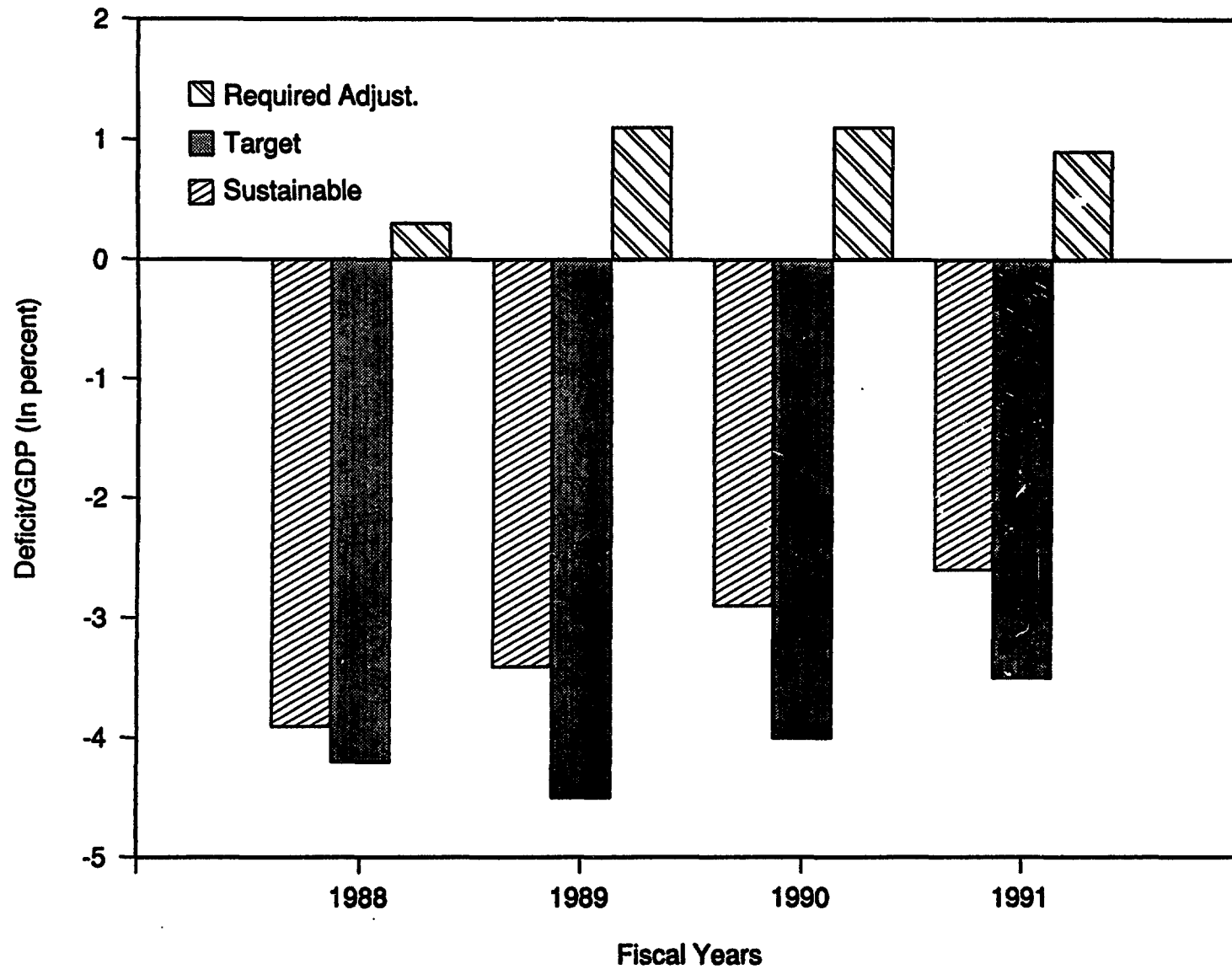
## Projections

(in percent of GDP)

	Inflation Tax (1)	Seignorage (2)	Sustainable Mon. Authority Operational Deficit (3)=-[(1)+(2)]	Sustainable Primary Deficit (4)	Sustainable Gov't Cash Deficit (5)	Target Gov't Cash Deficit (6)	Required Deficit Reduction (7)=(5)-(6)
1988	0.6	-0.2	-0.4	1.3	-3.9	-4.2	0.3
1989	0.5	-0.2	-0.4	2.1	-3.4	-4.5	1.1
1990	0.5	-0.1	-0.4	2.4	-2.9	-4.0	1.1
1991	0.4	0.0	-0.4	2.7	-2.6	-3.5	0.9
1988-1991 Average	0.5	-0.1	-0.4	2.1	-3.2	-4.1	0.9

# KENYA: DEFICIT PROJECTIONS

1988 - 1991



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choice of policy objectives. The results of table 4, also depicted in Graphs 3 and 4, show that, to the extent that the World Bank growth and inflation projections are consistent, the stabilization objective can be achieved during 1988-1991 with a lower rate for both inflation and growth. This is true both on average, and on a year-to-year basis. In other words, if taken literally, the Bank projections suggest that the performance of the Kenyan economy in the next four years will result in a substantial decline of its debt/GDP ratio. From the methodological point of view, the "warranted" growth and inflation rates of table 4 set the benchmarks against which any behaviorally consistent combination of those variables can be weighed.

### 3. GHANA

#### a. Background

Both adverse external developments and prolonged inappropriate domestic policies caused an extended deterioration in the Ghanaian economy during the late 70s and early 80s. The effects of a worsening in the external terms of trade, a succession of severe droughts and the influx of emigrant workers returning from Nigeria were compounded by a highly overvalued exchange rate and misaligned domestic prices. By 1982, real per capita income was lower than in 1970 by 30 percent, real export earnings by 52 percent, and import volumes by 30 percent.



TABLE 4. KENYA: A CONSISTENT MACROECONOMIC FRAMEWORK

## Assumptions

	Interest Payments (% of GNP)	Gov't Cash Deficit (% of GNP)	Change in Velocity (%)	Real Effective Exchange Rate Depreciation (%)
1988	5.5	-4.2	0.0	0.0
1989	5.2	-4.5	0.0	0.0
1990	5.3	-4.0	0.0	0.0
1991	5.3	-3.5	0.0	0.0

## Projections

(in percent)

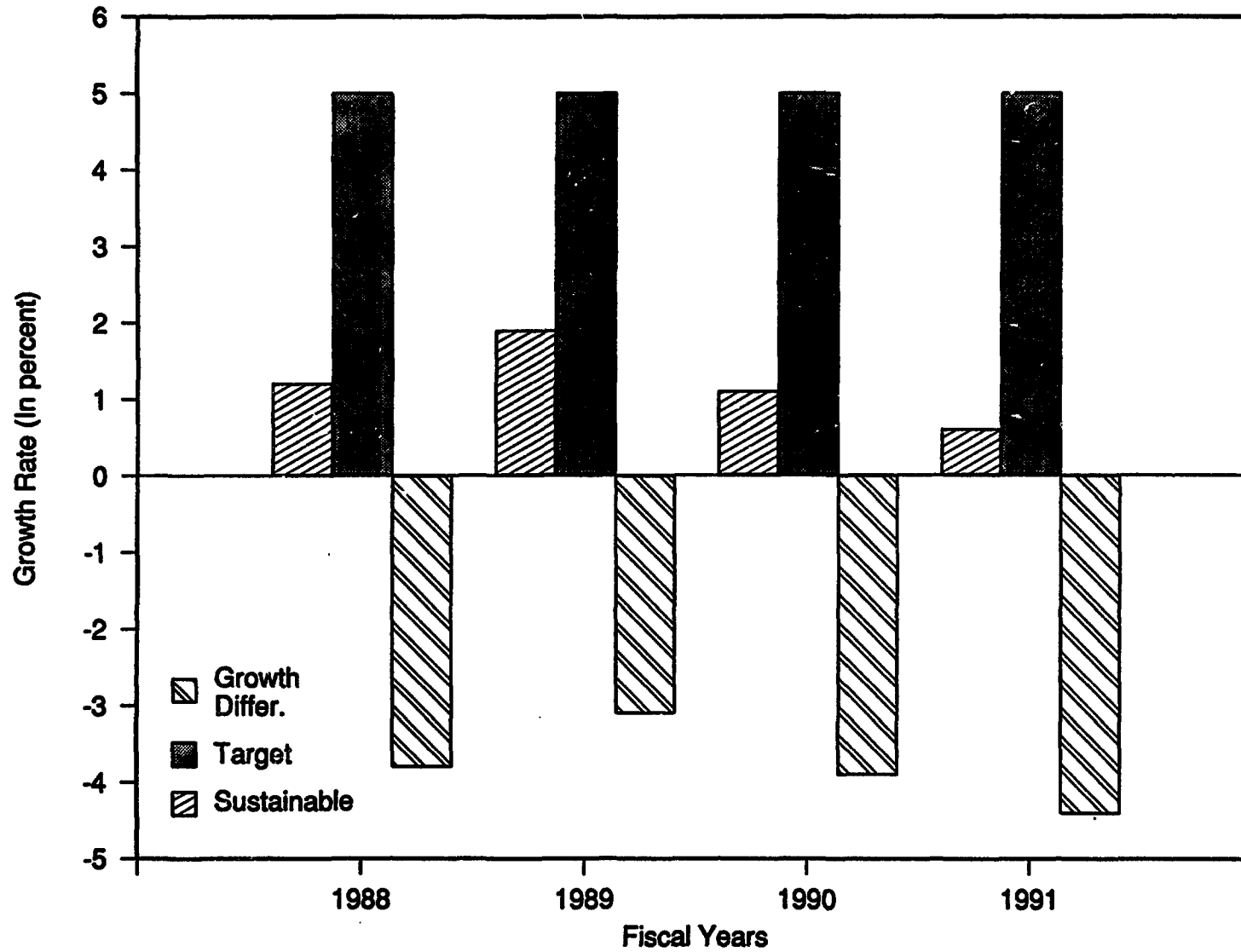
	Warranted Growth Rate (1)	Target Growth Rate (2)	Growth Differential 1/ (3)=(1)-(2)	Warranted Inflation Rate (4)	Target Inflation Rate (5)	Inflation Differential 2/ (6)=(4)-(5)
1988	1.2	5.0	-3.8	1.2	8.0	-6.8
1989	1.9	5.0	-3.1	1.9	7.0	-5.1
1990	1.1	5.0	-3.9	1.1	6.0	-4.8
1991	0.6	5.0	-4.4	0.6	5.0	-4.4
1988-1991 Average	1.2	5.0	-3.8	1.2	6.5	-5.3

1/ A positive number indicates required growth increase. A negative number indicates permissible growth decline.

2/ A positive number indicates required inflation increase. A negative number indicates permissible inflation reduction.

# KENYA: GROWTH PROJECTIONS

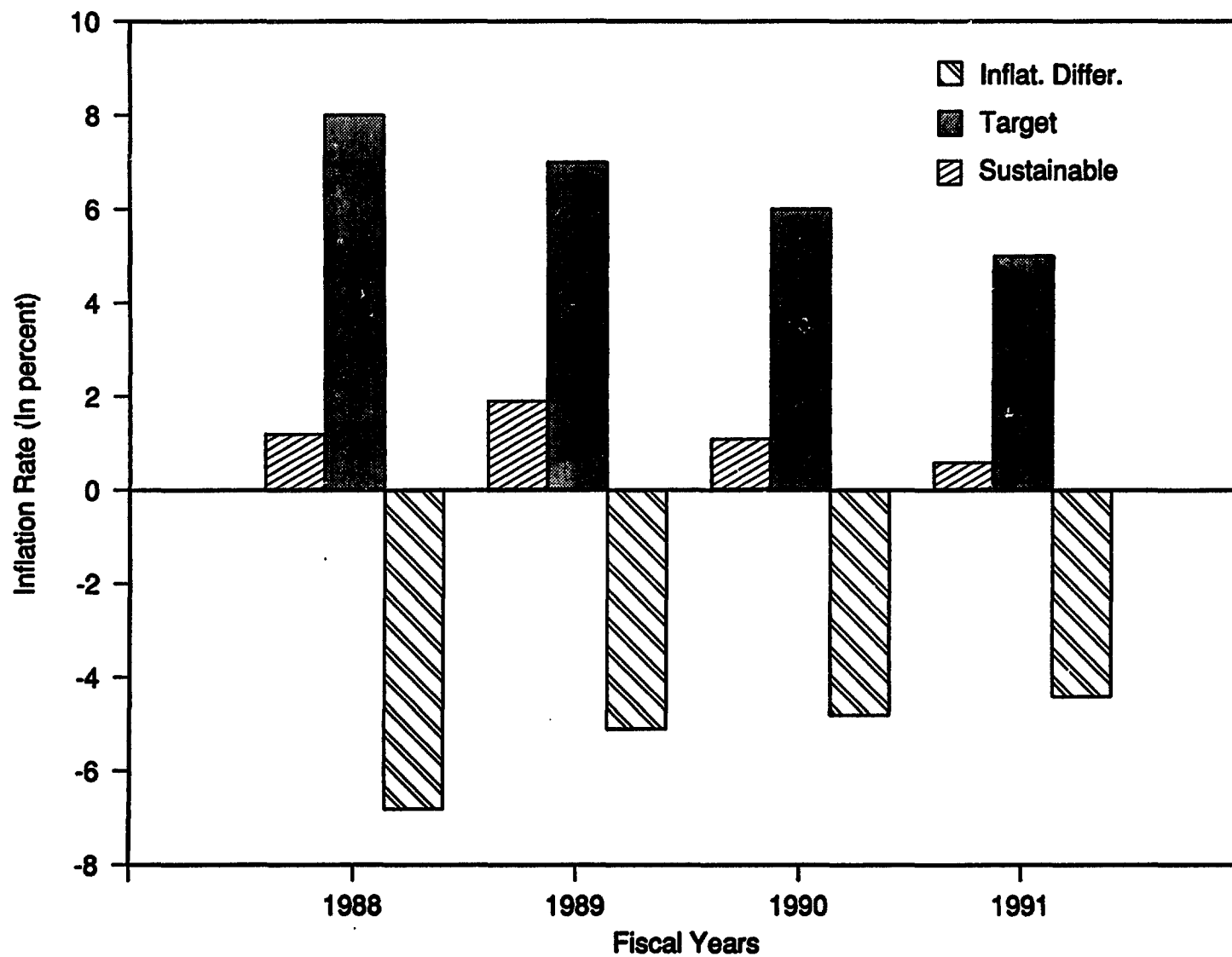
1988 - 1991



GRAPH 3

# KENYA: INFLATION PROJECTIONS

1988 - 1991



GRAPH 4

In 1983 the Government embarked on a three-year economic recovery program supported by resources from the IMF, the World Bank and various donors. The aim of the reforms was to restructure relative prices, to liberalize imports, and to restore monetary and fiscal discipline. The main instruments were a drastic devaluation and an increase in official producer prices, notably for cocoa. The program was very successful in many respects. It succeeded in arresting the prolonged economic decline, reducing inflation, containing the balance of payments deficit, and closing the gap between the parallel and the official exchange rates. At the same time, the Government recognized the structural nature of many problems besetting the economy, and in 1987-88 decided to formulate policies aiming at enhancing the process of structural adjustment. These policies included new adjustments in administered prices, a 23 percent real effective exchange rate devaluation in 1987, and a 30 percent across-the-board increase for civil servants in the 1988 budget. Interest rates were also liberalized, as were the controls on the sectoral distribution of credit.

The medium term objectives of the Government are principally the achievement of an average GDP growth rate of at least 5 percent, the raising of the investment ratio from about 13 percent to 16 percent, and a more efficient public resource use coupled with improved income distribution. To attain these objectives, emphasis will be placed on improved incentives for export promotion and import substitution, on increasing domestic resource stabilization through tax reform, and on a comprehensive restructuring of the financial sector.

On the fiscal side, the principal aim is to generate a budget surplus (excluding capital expenditure financed through external project aid), in order to allow Government to make net repayments to the domestic banking system between 1988-91. The interesting question, therefore, is whether the parameters of the macroeconomic framework over the next four years support or not the expectations of a decline in the debt/output ratio.

b. Empirical results

Table 5 and Graph 5 present the three concepts of deficit for the Central Government and the Monetary Authority over 1980-1987. The salient results are two: First, the difference between the accounts of the two authorities is minimal, a fact that mainly reflects the negligible amount of foreign reserves in Ghana during that period. Second, the operational deficit was in most years lower than the primary deficit. In fact, on average the operational balance was in surplus over the period. This reflects very high surpluses in the beginning of the period as a result of the strong cedi appreciation, and in general very low interest costs throughout the period due to the substantially negative real interest rates. Only in three years (1984, 1986 and 1987) was the operational deficit higher than the primary deficit, as a result of a strong negative influence of a real exchange rate devaluation. In 1984, when the cedi was devalued by over 60 percent in real terms, the operational deficit was even higher than the cash deficit. This interesting result suggests that the real costs of the economy for servicing the external debt were not adequately reflected in the cash operations of the budget.

TABLE 5. GHANA: BASIC FISCAL INDICATORS

	(Calendar Years)								1980-1987 Average
	1980	1981	1982	1983	1984	1985	1986	1987	
	----	----	----	----	----	----	----	----	-----
	(in percent of GDP)								
<b>Central Government</b>									
-----									
Cash Deficit	-8.0	-6.4	-4.7	-2.7	-2.1	-2.7	-0.7	-0.3	-3.5
Operational Deficit	0.8	5.5	-0.4	4.6	-4.5	-0.4	0.6	-0.4	0.7
Primary Deficit	-6.0	-4.3	-2.1	-1.5	-0.9	-1.2	1.5	1.2	-1.7
<b>Monetary Authority 1/</b>									
-----									
Cash Deficit	-8.0	-6.4	-4.7	-2.7	-2.1	-2.7	-0.6	-0.1	-3.4
Operational Deficit	0.8	6.2	-0.1	4.6	-4.7	-0.4	0.8	0.1	0.9
Primary Deficit	-6.0	-4.3	-2.1	-1.5	-0.9	-1.2	1.5	1.2	-1.7
<b>Memorandum Items</b>									
-----									
	(in percent)								
GDP Growth Rate	1.1	-3.5	-6.9	-4.6	8.9	5.1	5.2	4.8	1.3
Average Nominal									
Domestic Interest Rate	10.8	14.2	14.0	8.9	4.9	5.4	12.3	13.1	10.5
Domestic Inflation Rate	50.2	110.0	22.0	122.0	40.0	10.0	25.0	40.0	53.2
<b>Change in Real Effective</b>									
Exchange Rate 2/	30.7	122.4	25.0	-32.8	-61.4	-27.3	-42.4	-22.8	-1.1
<b>Debt/GDP 3/</b>									
	24.6	22.0	24.9	18.7	26.5	29.8	31.5	36.5	26.8

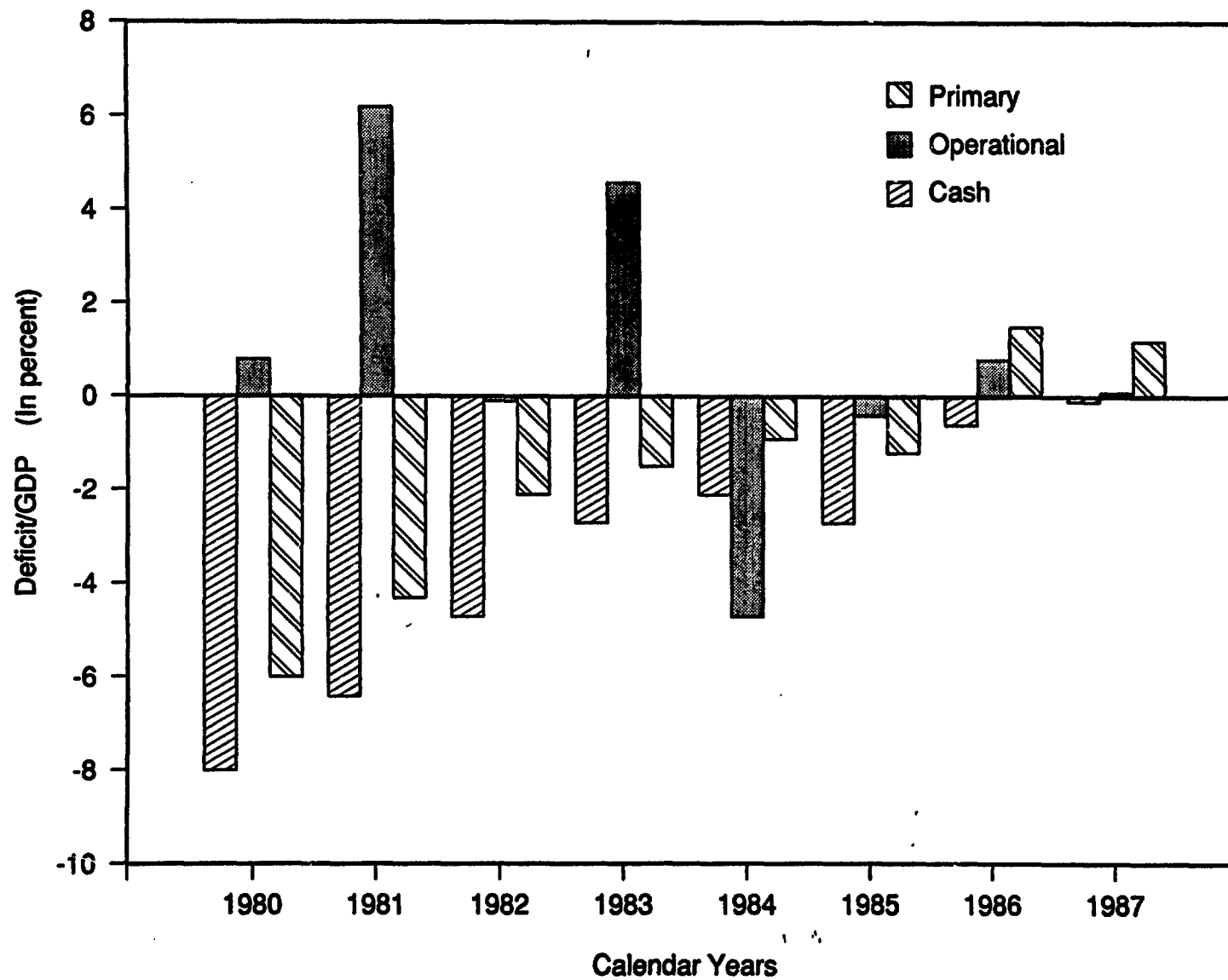
1/ Consolidated accounts of Central Government and Central Bank in respect of holdings of international reserves and positions vis-a-vis the IMF.

2/ A negative sign signifies depreciation. A positive sign signifies appreciation.

3/ Net domestic and external debt of the Monetary Authority.

# GHANA: DEFICIT CONCEPTS

1980 - 1987



GRAPH 5

Table 6 presents the sustainable and actual operational deficit and the warranted and actual rates of growth and inflation for the period 1980-1987. Between 1980-1984 the sustainable operational balance was actually in surplus, then turned into a deficit during the last three years, primarily as a result of the recovered growth rate. In contrast, the actual operational balance showed considerable variation during the same period but, on average, it turned out very close to the sustainable deficit at just under 1 percent of GDP. Not surprisingly, 1984-the year of the Great Devaluation-stands out as the period during which the budget deficit would have required a drastic reduction in its non-interest expenditures to secure the resources necessary to finance the public debt.

Table 6 also shows the combination of growth or inflation rates that would have achieved the same stabilization goal in the presence of actual fiscal developments. The warranted growth and inflation rates reflect the wide variations experienced by the Ghanaian economy in both its real and financial variables during a period of severe recession in the early 80s, followed by recovery and significant changes in relative prices in the past few years. The most interesting result of the table is the asymmetry between growth and inflation in extracting real resources for the government. For the period as a whole, the implied growth differential is marginally negative, suggesting that the average performance of the Ghanaian economy on the real side would have been adequate to achieve the stabilization of the debt/output ratio. On the other hand, the implied inflation differential is highly negative, indicating that the real loss to government from a potentially lower inflation rate would have still been outweighed by the gains from real growth, however small. This asymmetry is due to the fact that the marginal growth of



TABLE 6. GHANA: FISCAL POLICY CONCEPTS AND MACROECONOMIC VARIABLES

Calendar Years	(in percent of GDP)					(in percent)					
	Infla- tion Tax 1/ (1)	Sei- gnorage 1/ (2)	Sustainable Operational Deficit 1/ (3)=-[(1)+(2)]	Actual Operational Deficit 1/ (4)	Required Deficit Reduction 2/ (5)=(3)-(4)	Warranted Growth Rate (6)	Actual Growth Rate (7)	Implied Growth Differential 3/ (8)=(6)-(7)	Warranted Inflation Rate (9)	Actual Inflation Rate (10)	Implied Inflation Differential 4/ (11)=(9)-(10)
1980	7.7	-10.6	2.9	0.8	2.1	2.7	1.1	1.6	28.3	50.2	-21.9
1981	19.8	-23.2	3.4	0.2	-2.8	-38.1	-3.5	-34.6	30.7	110.0	-85.3
1982	2.8	-5.2	2.4	-0.1	2.5	7.4	-6.9	14.3	25.3	22.0	3.3
1983	15.0	-17.5	2.5	4.6	-2.1	-24.3	-4.6	-19.7	28.0	122.0	-93.4
1984	3.0	-4.5	1.4	-4.7	6.1	32.8	8.9	23.1	51.2	40.0	11.2
1985	0.7	0.4	-1.1	-0.4	-0.7	12.2	5.1	7.1	21.4	16.0	11.3
1986	1.0	0.0	-1.0	0.6	-2.6	10.4	5.2	5.2	29.6	25.0	4.4
1987	3.5	-2.4	-1.1	0.1	-1.2	0.9	4.8	-3.9	11.2	40.0	-28.8
1980-1987 Average	6.8	-7.9	1.1	0.9	0.2	0.4	1.3	-0.9	28.3	53.2	-24.9

1/ Monetary authority definition. See footnote 1, Table 1.

2/ A negative number indicates permissible deficit increase.

3/ A positive number indicates required growth increase. A negative number indicates permissible growth decline.

4/ A positive number indicates permissible inflation increase. A negative number indicates required inflation decline.

the economy between 1980-1987 was outweighed by the real gains of government due to the substantial negative real interest rates. In general, year-to-year variations are not very meaningful in countries with large fluctuations, and one should not place confidence on point estimates.

Table 7 and Graph 6 present a consistent fiscal policy framework for Ghana for 1988-1991. Based on the interest payment, inflation and growth projections of the World Bank, 13/ the model estimates the sustainable operational, primary and cash deficits and compares the latter with the target cash deficit of Government. The sustainable cash deficit is estimated on average at -2.1 percent of GDP whereas the target cash surplus (based on the IMF narrow definition) is 1.0 percent of GDP. The Government, therefore, appears to have a substantial room of maneuver, equivalent to 3.1 percent of GDP, in achieving its stabilization goal with a higher deficit (or, more accurately, with a deficit instead of a surplus), provided that the growth and inflation forecasts turn out to be correct.

Table 8 and Graphs 7 and 8 present the results of a consistent macroeconomic framework for 1988-1991. In this case the calculations are based on the broader definition of deficit, which includes aid-related capital projects. Despite the higher deficit projections, the data show that the target growth rate is on average overestimated by 1.6 percentage points, and

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13/ See Ghana: Country Economic Memorandum, Report No.7515-GH, November 23, 1988.

the inflation rate by 9.1 percentage points. Thus, the Government again appears to have a significant leeway in achieving its debt/GDP reduction strategy with a lower growth or inflation rate than the original targets. The actual policy tradeoff would still have to be determined through a behavioral relationship between growth and inflation against the benchmark values obtained in the table.

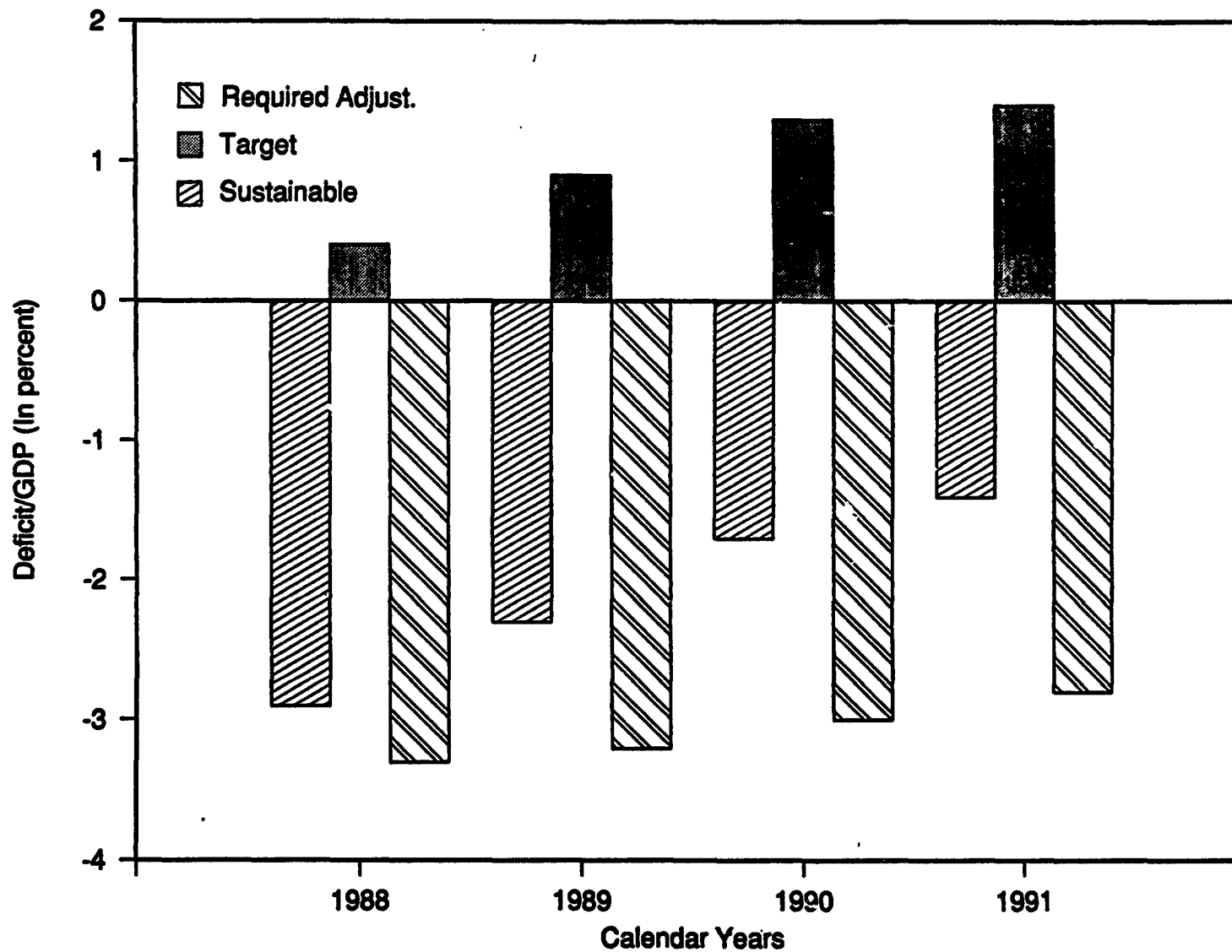
TABLE 7. GHANA: A CONSISTENT FISCAL POLICY FRAMEWORK

Assumptions							
	Interest Payments (% of GDP)	Inflation Rate (%)	Growth Rate (%)	Change in Velocity (%)	Real Effective Exchange Rate Depreciation (%)		
1988	1.2	21.8	5.5	0.0	0.0		
1989	1.2	15.2	5.8	0.0	0.0		
1990	1.1	9.1	4.9	0.0	0.0		
1991	1.1	5.0	4.9	0.0	0.0		
Projections (in percent of GDP)							
	Inflation Tax (1)	Seignorage (2)	Sustainable Mon. Authority Operational Deficit (3)=-[(1)+(2)]	Sustainable Primary Deficit (4)	Sustainable Gov't Cash Deficit (5)	Target Gov't Cash Deficit (6)	Required Deficit Reduction 1/ (7)=(5)-(6)
1988	1.9	-1.3	-0.5	-1.7	-2.9	0.4	-3.3
1989	1.3	-0.8	-0.5	-1.1	-2.3	0.9	-3.2
1990	0.8	-0.4	-0.4	-0.6	-1.7	1.3	-3.0
1991	0.4	0.0	-0.4	-0.3	-1.4	1.4	-2.8
1988-1991 Average	1.1	-0.6	-0.5	-0.9	-2.1	1.0	-3.1

1/ A negative number indicates permissible deficit increase.

# GHANA: DEFICIT PROJECTIONS

1988 - 1991



GRAPH 6

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TABLE 8. GHANA: A CONSISTENT MACROECONOMIC FRAMEWORK

Assumptions -----						
	Interest Payments (% of GDP) -----	Gov't Cash Deficit (% of GDP) 1/ -----	Change in Velocity (%) -----	Real Effective Exchange Rate Appreciation (%) -----		
1988	1.2	-3.3	0.0	0.0		
1989	1.2	-3.5	0.0	0.0		
1990	1.1	-3.5	0.0	0.0		
1991	1.1	-3.0	0.0	0.0		
Projections -----						
(in percent)						
	Warranted Growth Rate (1) -----	Target Growth Rate (2) -----	Growth Differential 2/ (3)=(1)-(2) -----	Warranted Inflation Rate (4) -----	Target Inflation Rate (5) -----	Inflation Differential 3/ (6)=(4)-(5) -----
1988	3.2	5.5	-2.3	3.2	21.8	-18.6
1989	3.8	5.8	-2.0	3.8	15.2	-11.4
1990	4.1	4.9	-0.8	4.1	9.1	-5.0
1991	3.5	4.9	-1.4	3.5	5.0	-1.5
1988-1991 Average	3.7	5.3	-1.6	3.7	12.8	-9.1

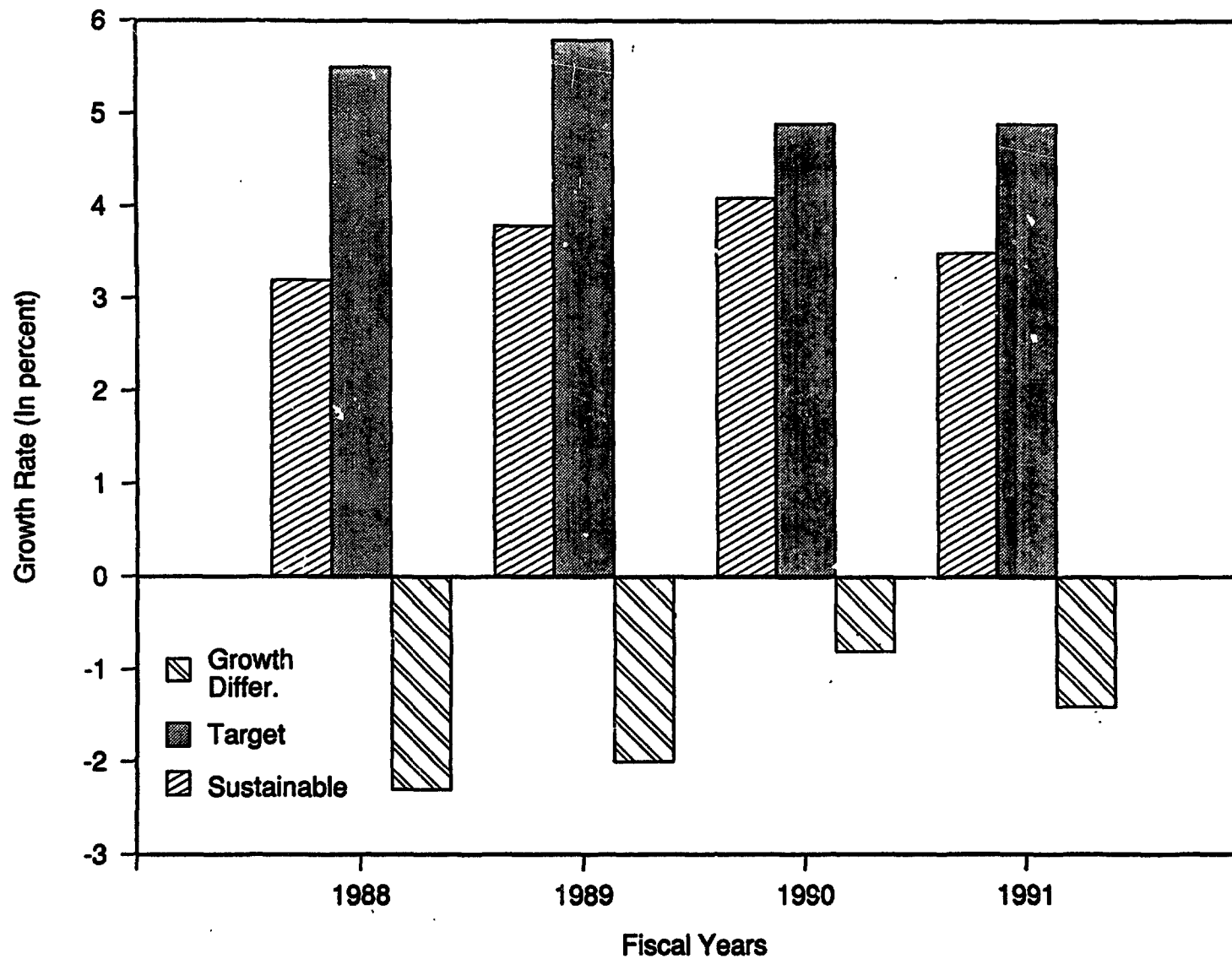
1/ IMF broad definition; includes aid-related capital expenditures.

2/ A positive number indicates required growth increase. A negative number indicates permissible growth decline.

3/ A positive number indicates required inflation increase. A negative number indicates permissible inflation reduction.

# GHANA: GROWTH PROJECTIONS

1988 - 1991



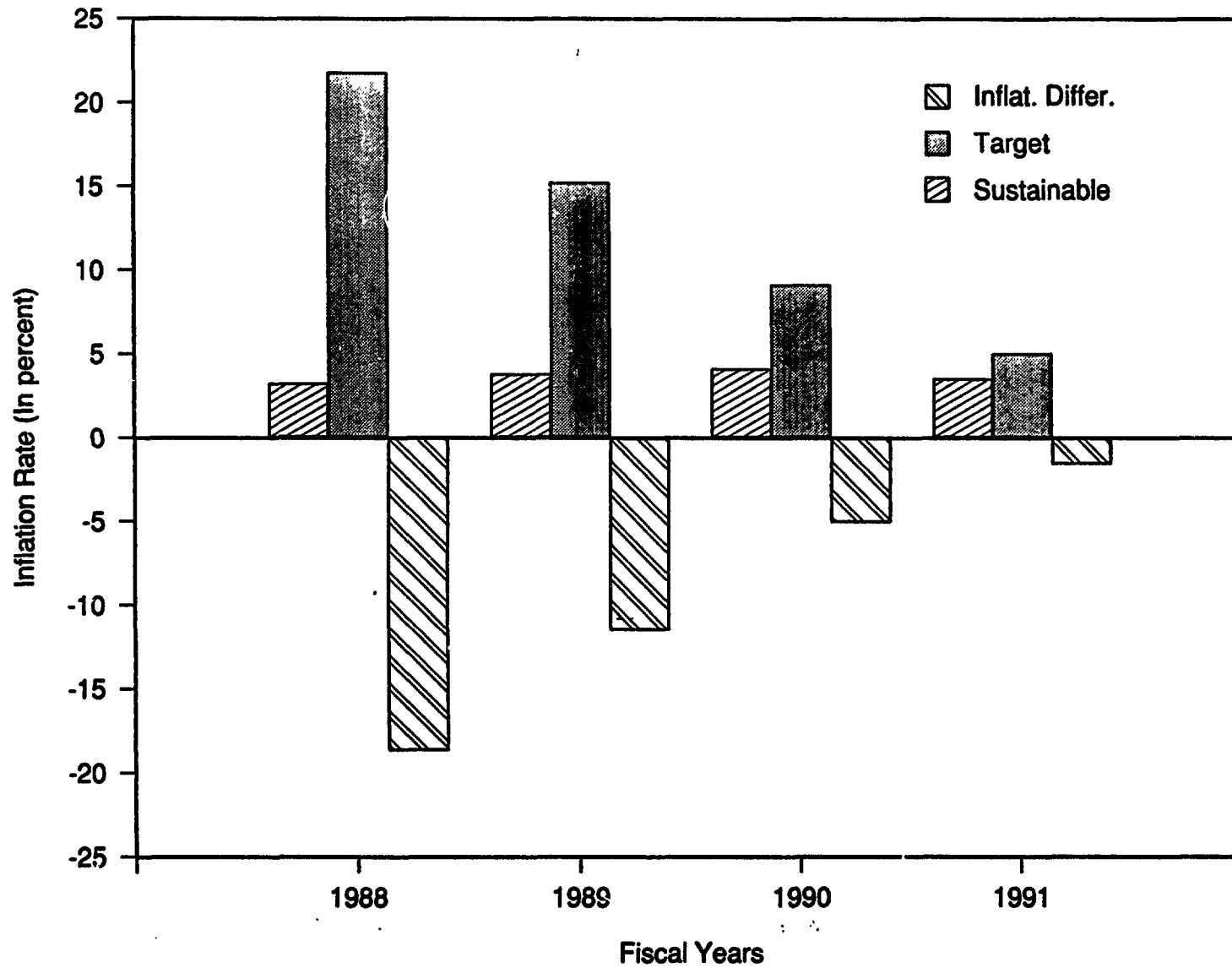
GRAPH 7

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# GHANA: INFLATION PROJECTIONS

1988 - 1991



GRAPH 8



## V. SUMMARY, CAVEATS AND CONCLUSIONS

This paper has developed an integrated framework relating four basic macroeconomic variables to three concepts of the fiscal deficit. The macroeconomic variables are the interest rate, the inflation rate, the growth rate and the real exchange rate. The three deficit concepts are the cash (or observed), the primary, and the operational deficit. Each concept serves a useful purpose for the evaluation and determination of macroeconomic policy, but it is the operational deficit that best reflects the absorption of real resources by government, and thus sets the limits for the long-term sustainability of fiscal imbalances. In the context of this paper, the basic question was whether the operational deficit would be financeable without increasing the real debt burden.

Additionally, the paper has presented a methodology for combining the fiscal accounts with those of the Central Bank, thus deriving the balance of the Monetary Authority - a concept that best reflects the "true" fiscal stance of government. A proper measurement of the Monetary Authority operational deficit would be much closer to the absorption of real resources by the public sector than the cash deficit of the Central Government.

From the analytical point of view, the purpose of the paper was twofold: first, to compare the "sustainable" with the actual fiscal deficit in a historical perspective. Second, to check the consistency of fiscal policy within a pre-defined macroeconomic framework over the medium term. This was attempted in two ways: first, by accepting the actual macroeconomic

setting and comparing the observed (and in the case of future simulations, the projected) deficit with the sustainable deficit; second, by accepting the actual (or projected) deficit, and wondering what the appropriate macro-economic setting should have been (or must be in the future). In both cases, the basic assumption was the stabilization of total (domestic and external) debt to GDP. 14/

The most important limitation of the paper is that the model is basically a set of macroeconomic identities, with no behavioral content. Consequently, the main weakness stemming from this limitation relates to the calculation of the inflation tax, which is basically assumed to be a linear function of the monetary base. As the monetary base is a direct liability of government vis-a-vis the private sector, high and persistent inflation represents a direct capital gain for the public sector. Yet, as with any other tax, too high a tax rate (in this case, the rate of inflation), leads to an erosion of the tax base: a high inflation may lead to a serious contraction of the monetary base, as the private sector reduces its demand for currency and demand deposits. Such a possibility is not allowed in this model. A second limitation is related to the implicit assumption made throughout the paper that real interest rates are invariant with respect to inflation or, equivalently, that the nominal interest rate fully reflects inflationary expectations in the Fisher equation.15/ To the extent that this assumption

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14/ As already discussed this assumption was taken as a first, working hypothesis. In Kenya, and especially in Ghana it may be desirable to reduce the ratio of the debt to GDP.

15/ For a further discussion of this point see Catsambas (1988).

is not always true, the empirical conclusions of the paper would almost certainly have to be modified. More generally, the true impact of inflationary financing or of a serious devaluation on the macroeconomy can be properly addressed only if the decision-makers are in a position to assess the behavioral response of economic agents to an integrated set of flow and stock variables.

The conceptual framework developed in part III was applied to Kenya and Ghana over the period 1980-1987 and was extended for the period 1988-1991 in the form of medium-term fiscal and macroeconomic projections. The problems encountered in the empirical application of the model were serious for both countries and of a similar nature. The most important constraint for the proper application of the model was the inconsistency encountered between the financing of the deficit and changes in the stocks of domestic and external debt. <sup>16/</sup> This problem may have affected the calculations of the historical period both for the sustainable operational deficit and for the warranted inflation and growth rates.

A second general problem was the lack of sufficient information for the proper calculation of changes in net worth of the Central Bank. The problem was less serious in the case of Kenya, where there is a statutory provision for the transfer of Central Bank profits to the budget. In the case of Ghana, where no similar provision exists, or even in Kenya to the extent that this issue has not been properly addressed in the official statistics, there is a possibility that the Monetary Authority deficit may have still been underestimated by an unknown quantity.

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<sup>16/</sup> See Appendix 3 for an explanation of how this problem was resolved for each of the two countries.

A third general problem relates to the proper measurement of the external debt. As Anand and van Wijenbergen (1988) demonstrate, cross-exchange rate variations may have serious consequences for the proper valuation of debt denominated in various currencies, and they thus recommend the use of a weighted debt-output and debt-exports ratio, along the lines suggested by Cohen (1986). <sup>17/</sup> Absence of a detailed breakdown of external debt statistics by currency necessitated the use of the assumption that the debt statistics of Kenya and Ghana have properly and adequately incorporated valuation changes resulting from dollar fluctuations vis-a-vis other currencies.

A particular problem for Kenya was the use of fiscal year data in its budgetary accounts. The transformation of national income accounts data on a fiscal year basis through a simple arithmetic average may have introduced a margin of error of unknown magnitude. This particular problem, as well as the more general one of official data reporting in a timely and consistent fashion, suggest that for both countries it is preferable to focus on average statistics rather than on year-to-year (point) estimates during the historical period.

All of these qualifications notwithstanding, the results for the two countries were interesting, if only because of their similar implications. In the case of Kenya it appears that deficit developments between 1980-1987, and

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<sup>17/</sup> See also Turkey: External Debt, Fiscal Policy and Sustainable Growth, volume I: The Main Report, September 9, 1988 Report No.7162-TU, The World Bank.

also the budget projections for 1988-1991, are broadly consistent with a general notion of stabilization. Similarly, the official projections for growth and inflation between 1988-1991 suggest that, if the fiscal targets are adhered to, the basic stabilization goal will be met and probably overshoot.

In the case of Ghana, the historical data show that both the fiscal balance and the actual growth rate would have been broadly adequate to achieve stabilization. The future projections parallel those of Kenya insofar as they appear to present the Government with substantial room of maneuver for its stabilization goals. Therefore, even with moderate slippages on all fronts, the Ghanaian economy appears to be on the track of achieving its desirable goal of net repayments of its debt to the banking sector. 18/

The obvious suggestions for future research in this area are, first, an extension of the conceptual framework to incorporate some basic behavioral relationships and, second, a serious effort to improve on the consistency between stock and flow statistics, especially in the area of debt and budget financing. It is also apparent that a deeper analysis of the issues addressed in this paper would require a more thorough examination of fiscal and Central Bank statistics, particularly the balance sheet of the latter. This suggests

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18/ This is a somewhat stretched statement. Interest payment projections for both Kenya and Ghana were not available on a domestic-foreign debt breakdown and, consequently, the implied debt reduction cannot, strictly speaking, be attributed to the domestic or the foreign component of the debt. This statement, therefore, reflects more the intended policy of the Government than a conclusion based on data.

that a comprehensive investigation of these questions can probably not be accomplished except as the focus of an ad hoc mission to the countries in question. In the meantime, the present methodology could serve as an initial step for a broad consistency check on fiscal policy within the framework of growth with adjustment.

Appendix 1

THE SUSTAINABLE CURRENT ACCOUNT DEFICIT

To bring the current account deficit explicitly into the picture, consider the following relationship:

$$E(\text{CAD}) + iE(\dot{B}^* - \dot{NFA}) = E(\dot{B}^* - \dot{NFA}) \quad (\text{A.1})$$

Equation (A.1) states that the interest exclusive current account deficit (CAD) plus net interest payments equal the change in the net foreign liabilities of the public sector, i.e. the difference between the foreign debt,  $B^*$ , and net foreign assets, NFA.

In real terms equation (A.1) is equivalent to:

$$ec + ief = e \frac{\dot{F}}{P^*} \quad (\text{A.2})$$

$$\text{where } c = \frac{\text{CAD}}{P^*}, F = B^* - \text{NFA}, e = \frac{EP^*}{P} \text{ and } f = \frac{F}{P^*}$$

Since  $\frac{\dot{F}}{P^*} = \dot{f} + \pi^* f$ , equation (A.2) may be rewritten as

$$ec + e\pi^* f = e\dot{f} \quad (\text{A.3})$$

where  $r^* = i - \pi^*$  is the real foreign interest rate. Furthermore, using the identity:

$$e\dot{f} = (e\dot{f}) - \hat{e}fe \quad (\text{A.4})$$

equation (A.3) may be expressed as:

$$ec + e(r^* + \hat{e})f = (e\dot{f}) \quad (\text{A.5})$$

where  $\hat{e} = \frac{\dot{e}}{e}$  is the real exchange rate.

To derive this expression in terms of output shares define

$\gamma = \frac{ec}{y}$ ,  $\phi = \frac{ef}{y}$ , where  $y$  is real output. Therefore,

$$\gamma + (r^* + \hat{e})\phi = \frac{(e\dot{f})}{y} \quad (\text{A.5'})$$

$$\text{But } \frac{(e\dot{f})}{y} = \dot{\phi} + \phi q \quad (\text{A.6})$$

Substituting equation (A6) into (A5') we finally obtain:

$$\gamma + (r^* + \hat{e} - q)\phi = \dot{\phi} \quad (\text{A.7})$$

which is the fundamental dynamic equation that relates the current account deficit with changes in the net foreign liabilities of the monetary authority. Provided that the definitions of  $\gamma$  and  $\phi$  coincide with those



implied by the activities of the government sector, we may substitute equation (A.7) into equation (21) to obtain the current account deficit under the premise of a constant domestic debt/output ratio.

Doing this yields:

$$\gamma = \frac{g-t}{y} + (r - q) \beta - (q + \pi - \theta)\mu \quad (\text{A.8})$$

Equation (A.8) states that the current account basically finances the gap between the fiscal deficit and the monetary liabilities of the economy in a situation with a constant domestic debt/GDP ratio. If the government's seignorage and inflation tax are higher than the operational fiscal deficit, the country will run a current account surplus. <sup>1</sup>

Finally, the sustainable current account deficit, defined to be the one that raises external debt only at the rate of economic growth, is obtained from equation (A.7) Setting  $\dot{\phi} = 0$  and solving for  $\gamma$  we get:

$$\gamma = (q - r^* - \hat{e})\phi \quad (\text{A.9})$$

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<sup>1/</sup> The reader is reminded that, in this exercise, the current account refers only to the operations of the Monetary Authority.

Not surprisingly, equation (A.9) states that the current account may be in deficit only if the growth rate of the economy exceeds the effective foreign interest rate, i.e. the real rate plus the real exchange rate depreciation. Otherwise, the (government) current account will have to be either balanced, or in surplus.

Appendix 2

SOURCES OF DATA

A. KENYA (Fiscal years; in million pounds)

1. Kenya - Recent Economic Developments and Selected Policy Issues, The World Bank, report 7411-KE, September 26, 1988.
2. Kenya - Public Expenditure Review, Main Report and Annex Volume, The World Bank, report 7508-KE, November 21, 1988.
3. Kenya - Recent Economic Developments, International Monetary Fund, SM/88/24, January 20, 1988.
4. Kenya - Exchange rate indices, ETR, IMF, unpublished.
5. International Financial Statistics, IMF, various issues.

B. GHANA (Calendar years; in million cedis)

1. Ghana - Structural Adjustment for Growth, Country Economic Memorandum, report 7515-GH, The World Bank, November 23, 1988.
2. Ghana - Statistical Annex, SM/88/242, IMF, October 31, 1988.
3. Ghana - Exchange rate indices, ETR, IMF, unpublished.
4. International Financial Statistics, IMF, various issues.

Appendix 3

DEFINITION OF VARIABLES

This Appendix explains the derivation of variables that have not been obtained from primary sources. The following abbreviations are used: CG = Central Government, MA = Monetary Authority, NFA = Net Foreign Assets.

A. Kenya

<u>MA NFA interest receipts:</u>	NFA x average foreign interest rate.
<u>MA cash deficit:</u>	CG cash deficit less MA NFA interest receipts.
<u>Domestic borrowing:</u>	derived as a residual.
<u>CG stock of domestic debt:</u>	constructed on the basis of CG net domestic borrowing.
<u>Nominal average domestic interest rate:</u>	calculated implicitly from budget interest payments and the average domestic debt outstanding.
<u>CG stock of foreign debt:</u>	constructed on the basis of CG foreign interest payments and the average foreign interest rate
<u>MA net foreign debt:</u>	CG stock of foreign debt less MA NFA.
<u>Foreign inflation:</u>	derived implicitly from the real exchange rate formula.

All variables have been deflated by the CPI and all translations to and from the local currency have used the average nominal dollar exchange rate. All variables are expressed in Kenyan pounds. National income accounts data, wherever unavailable in fiscal years, have been transformed to fiscal year basis through a simple arithmetic average. Calculations based on flow and stock variables have used a stock average over the relevant period.

B. GHANA

<u>Nominal average foreign interest rate:</u>	Calculated implicitly from budget foreign interest payments and foreign debt outstanding.
<u>MA NFA interest receipts:</u>	NFA x average foreign interest rate.
<u>MA cash deficit:</u>	CG cash deficit less MA NFA interest receipts.
<u>Domestic borrowing:</u>	derived as a residual.
<u>Nominal average domestic interest rate:</u>	calculated implicitly from budget domestic interest payments and the average domestic debt outstanding.
<u>MA net foreign debt:</u>	CG stock of foreign debt less MA NFA
<u>Foreign inflation:</u>	derived implicitly from the real exchange rate formula.

All variables have been deflated by the CPI and all translations to and from the local currency have used the average nominal dollar exchange rate. All variables are expressed in Ghanaian cedis. Calculations based on flow and stock variables have used a stock average over the relevant period.

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